

## Glendale, California Municipal Invests in Smart Grid to Enhance Customer Services and Improve Operational Efficiencies

City-owned Glendale Water and Power (GWP) has completed its smart meter installation and is implementing a suite of new offerings to improve operational efficiencies and help customers save energy and manage their electric bills. With \$20 million in Smart Grid Investment Program (SGIG) funds,<sup>1</sup> the municipal utility has been able to replace all 85,000 electric meters in Glendale well ahead of schedule. “Without the DOE funding, completion of our smart meter deployment would have been a few more years out and would have not included some of the technologies and capabilities that we now have available,” said Glenn Steiger, GWP’s General Manager.

### New Customer Services

The accelerated deployment timeline for smart meters has allowed GWP to offer new customer services sooner than originally planned. For example, the SGIG funding enabled GWP to offer customers several options to access real-time energy usage data, including a web portal and in-home displays on a digital photo frame. “We expect annual energy savings of ten to twelve percent, if not more, once all GWP customers are fully engaged with the usage data provided by the smart meters,” says Craig Kuennen, GWP’s Smart Grid Project Manager.

GWP’s smart grid systems also contribute to integrating new energy systems into the grid. For example, GWP is using SGIG grant funding to interconnect 162 thermal energy storage units to its wireless distribution area network. The 1.5 megawatts of thermal energy storage installed on several Glendale city buildings and local businesses makes ice at night, when overall demand is relatively low and local power is available from GWP’s landfill gas plant. The buildings use the ice for space cooling during the day, helping reduce peak load and decreasing the need to purchase power when prices are highest. In addition, GWP can apply its new smart grid capabilities to the deployment of



A digital photo frame is part of Glendale Water and Power’s (GWP’s) in-home display pilot that is enabling customers to track their usage without having to go online to access the data.

<sup>1</sup> The SGIG program is funded by the American Recovery and Reinvestment Act (Recovery Act) and administered by the U.S. Department of Energy.

electric vehicles (EV) and photovoltaics (PV). GWP currently offers EV charging station incentives to 100 customers, and about 200 PV systems are installed in its service territory. “GWP recognizes the importance of AMI [advanced metering infrastructure] and its data for enabling expansion of our EV and PV programs. These programs are popular in southern California, and we expect growth in these areas,” says Kuennen. GWP anticipates deployment of 1,200 EVs by 2015, and 7,000 EVs by 2020.

GWP is also going beyond the scope of the SGIG project to increase efficiencies for the customer and the utility by building on the smart grid infrastructure and expanding offerings in other areas. Although outside of the DOE funded effort, GWP has installed 33,400 smart water meters. GWP is one of the first utilities in the nation to implement both electric and water smart meters in its entire service territory. “As an electric and water utility, the incremental cost of adding water meters was not much more. Water meters are less complex than the electric meters, and utilize much of the same technology that GWP is putting in place for its electric meters anyway,” says Steiger. “So it made perfect sense.” Nearly 20 percent of California’s electricity is used to pump, treat, and move water to California homes and businesses. As part of its smart water meter deployment, GWP has also installed leak detection technology, such as acoustic sensors designed to detect leaks on GWP’s side of the meter. Leak detection saves not only water but also electricity, reducing GWP’s operating costs—and saving customers from property damage.

### **Increasing Operational Efficiencies While Planning for Future Technologies**

Like most utilities, GWP’s interest in smart grid deployment includes not only enhancing customer services but also containing costs, increasing operational efficiencies, and improving reliability. GWP is implementing an enterprise service bus (ESB)<sup>2</sup> to integrate its systems and consolidate communications among departments. With the installation of an ESB, the utility is building an information technology (IT) system and process that accommodates changes as they inevitably occur in technologies and applications or in consumer needs in the future. GWP is also expanding data sharing across business units to increase operational efficiencies.

GWP has begun initial testing for an upcoming Feeder Automation and Substation Automation Pilot Project, also partially funded by SGIG. For this pilot project, GWP is rebuilding an existing substation with all the technologies required for distribution automation, including four automated feeders. “GWP has put together a long-term plan, so if all goes well with the pilot, we will be able to automate all of the substations in the city in about ten years,” says Kuennen.

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<sup>2</sup> An enterprise service bus (ESB) is a software architecture model that enables reliable interaction among a variety of IT applications—a valuable smart grid asset, as the ESB allows otherwise-incompatible smart and legacy systems to communicate with each other.

GWP is also determining how best to manage and analyze the extraordinary amount of data transmitted by the smart meters. The utility is establishing new internal processes and employing the tools and resources necessary to manage and analyze the data.

### **Workforce Development**

In addressing these large-scale shifts in IT and data management, GWP recognized a need for an equivalent change in corporate culture—including upgrades to existing skill sets. To meet the needs of a digital grid, the utility is re-training current staff. GWP made a promise that no one was going to lose his or her job as a result of this project, and management has been successful in placing employees in new positions—often at higher levels of compensation. The GWP project is also creating new jobs. The required skill level of IT and data management necessitates that GWP employ new IT specialists. Says Steiger, “As deployment got under way, it became clear very quickly that the driver of what GWP is doing today, as well as in the future, is going to be IT...[and] staffing these new functions is no trivial task.” Newly-hired systems experts are planning and deploying assets such as the ESB and developing the interfaces to make the new software work with the legacy systems, and a full-time cybersecurity manager was hired to re-architect the system city-wide.

GWP also has an eye toward establishing its future workforce. With additional Recovery Act grant funding from DOE’s Workforce Training in the Electric Power Sector Program,<sup>3</sup> GWP is updating and expanding the electrical workforce training program it created in partnership with Glendale Community College and the Verdugo Workforce Investment Board. “The Verdugo Power Academy takes young people here in Glendale who desperately need professional job skills and trains them to qualify for entry-level positions in the electric utility industry,” says Steiger. Three graduates are now employed in GWP’s meter shop on AMI work. “We used the Power Academy to support needs within our SGIG grant and have found the two DOE-funded grants working hand-in-hand to benefit our company and the local community,” adds Steiger.

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<sup>3</sup> The Workforce Training in the Electric Power Sector Program is facilitating the development of a highly skilled electric power sector workforce for modernizing the electric grid. Recipients include power companies, non-profits, institutions of higher education, and local and state governments. More information about this program can be found on [smartgrid.gov](http://smartgrid.gov) and in the case study: “[Workforce Training for the Electric Power Sector: Transforming the Nation's Electric Grid by Training Skilled Workers.](#)”

## Learn More

The Recovery Act provided DOE with \$4.5 billion to fund projects that modernize the Nation's energy infrastructure and enhance energy independence. For more information about the status of other Recovery Act projects, visit [www.smartgrid.gov](http://www.smartgrid.gov). To learn about DOE's Office of Electricity Delivery and Energy Reliability's national efforts to modernize the electric grid, visit [www.oe.energy.gov](http://www.oe.energy.gov).



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